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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,606	12/12/2003	Helen M. Moore	9692-000030	2491

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EXAMINER	
AGRAWAL, RITESH	
ART UNIT	**PAPER NUMBER**
1631	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/735,606	MOORE ET AL.	
	Examiner	Art Unit	
	Ritesh Agrawal	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-10 and 12-35* is/are pending in the application.

4a) Of the above claim(s) *22-35* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4-10 and 12-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicants' amendment and request for reconsideration in the communication filed on 11/29/06 are acknowledged and the amendments entered.

Claims 1, 2, 4-10, and 12-35 are currently pending. Claims 1, 2, 4-10, and 12-21 are currently under consideration.

Withdrawn Rejections

2. The rejection of claims 1-10, 12-17, 19 and 21 under 35 U.S.C. 102(a) as being anticipated by Kent et al. is withdrawn in light of applicant's amendments.

The rejection of claims 1, 3, 4, 8, 9, 10, 13, 15, and 21 under 35 U.S.C. 102(b) as being anticipated by Semple is withdrawn in light of applicant's amendments.

Oath/Declaration

3. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

Non-initialed and/or non-dated alterations have been made to the oath or declaration. See 37 CFR 1.52(c).

The alterations to the address of inventor Fu Lu were not initialed and dated.

This objection is reiterated from the Office Action mailed 08/29/06 because it has not been addressed in applicant's response filed 11/29/06.

Specification

4. The disclosure is objected to because of the following informalities:

The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. Such code can be found, for example, on page 15 of the specification. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

Appropriate correction is required.

This objections are reiterated from the previous Office Action. While applicant amended the specification to remove the browser executable code on page 15, there are still other instances of such code that have not been removed (e.g. see page 12 of the specification). It should be noted that the objections only exemplify the required changes. Applicant is required to search the specification and remove all instances of browser executable code.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 7-10, and 12-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 7-10, and 12 recite the limitation "the viewer" in line 2 and claim 13 recites the phrase "said viewer" in line 2. The phrase lacks clear antecedent basis. Claim 1, from which they depend, recites "a viewer adapted to integrate the comparative genomic data" and "a multiple sequence alignment viewer". It is unclear as to which of these viewers the phrase refers. This rejection is newly applied but is necessitated by applicant's amendment.

Given the requirement for a "multiple sequence alignment viewer" in claim 1, it is unclear whether the ability to select a "multiple sequence alignment viewer" in claim 13 means that the interactive display system can have two "multiple sequence alignment viewers" or whether the "multiple sequence alignment viewer" of claim 1 is the same as the "multiple sequence alignment viewer" of claim 13. This rejection is newly applied but is necessitated by applicant's amendment.

Claims 14-18 recite the limitation "said viewer" in line 2. There is insufficient antecedent basis for this limitation in the claim. Claim 13, from which they depend, recites multiple different viewers. It is unclear to which of the multiple different viewers the limitation refers.

This rejection is reiterated from the previous Office action mailed 12/29/05. Applicant's arguments filed 3/13/06 have been fully considered but they are not deemed persuasive. Applicant argues:

> Claims 14-18 recite the feature "said viewer" in line 2. These claims each depend on claim 13, which also recites "said viewer" in line 2, and where claim 13 is dependent on claim 1. Independent claim 1 introduces "a viewer adapted to integrate the comparative genomic data." Thus, "said viewer" in claims 14-18 each stems from "said viewer" in claim 13, which stems from "a viewer adapted to integrate the comparative genomic data" from claim 1. Claim 13 recites a

> group of various viewer components (i.e., viewer components (a) through (f)) and claims 14-18 describe viewers containing various numbers of these viewer components.
>
> As a result, there is sufficient antecedent basis for "said viewer" in claims 14-18 as this feature directly follows from claim 13 which follows from claim 1. Applicants respectfully request reconsideration and withdrawal of the rejection. (remarks, pages 1-2)

The use of the phrase lacks a clear antecedent basis because both claims 1 and 13 recite multiple viewers. For example, amended claim 1 recites "a viewer adapted to integrate the comparative genomic data" and "a multiple sequence alignment viewer" while claim 13 recites a viewer which "comprises at least two viewer components", and a series of viewer components which are viewers themselves. It is therefore unclear as to which of these viewers the phrase "said viewer" refers.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 1-2, 4, and 7-10, and 12-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Sears et al. (Patent Publication #2003/0220820 with a priority date of November 13th, 2001) or, in the alternative, under 35 U.S.C. 103(a) as obvious over Sears et al. (Patent Publication #2003/0220820) in view of Mural et al. (IDS, Science, Volume 296, Pages 1661-1671, May 2002).

This rejection is modified from the one presented in the previous Office Action but the modification was necessitated by applicant's amendment (the previous claim set

did not contain a claim requiring both that the interactive display system comprise comparative genomic data comprising syntenic anchors and blocks and a multiple sequence alignment viewer. Since the independent claim now contains both of these limitations, all of the claims contain newly claimed subject matter).

The claims are drawn to an interactive display system comprising a database of comparative genomic data and a viewer wherein the comparative genomic data comprise syntenic anchors and syntenic blocks and the viewer comprises a multiple sequence alignment viewer.

Sears et al. provide for an interactive display system with a graphical viewer and database of comparative genomic data, "[t]he present invention can be used to provide a graphical interface for the visualization and analysis of genome informatics; . . . display comparative genomic information from two or more organisms simultaneously . . . [and] allow a user to interact and manipulate the data through the display, " (paragraph 11, lines 1-9). With respect to the syntenic anchors and syntenic blocks, Sears et al. disclose, " [the] first type of biological data comprises at least one of . . . orthologous (syntenic) regions between mouse and human chromosomes, " (claim 9, lines 1-2 and 5). Furthermore, they disclose the creation of a "Genome Comparison Graph" that indicates regions of similarity across genomes (paragraph 7, lines 7-10) where these regions of similarity are further demarcated by individual "markers" (paragraph 46, lines 8-12). Hence, Sears et al. disclose their database contains syntenic regions (syntenic blocks) and markers for such conserved regions (interpreted as syntenic anchors). With respect to the presence of a multiple sequence alignment viewer, Sears et al. disclose

the ability to run BLAST searches from their display system. As the output of a BLAST search includes a multiple sequence alignment, in allowing the user to view the output of a BLAST search, the system is allowing for a mechanism by which one can visualize a multiple sequence alignment.

With respect to claim 2 with the additional limitation of an ortholog identifier, Sears et al. disclose the use of the BLAST program which is well known to those in the art as a means of finding orthology, " [t]he graphical interface can provide Basic Local Alignment Search Tool (BLAST) functionality," (paragraph 51, lines 1-2).

With respect to claim 4 with the additional limitation of the two species being mouse and human, Sears et al. disclose the use of mouse and human sequences as disclosed above.

With respect to claim 7 with the additional limitation that the viewer contain a map viewer which shows genomic sequence information of the two or more species which markers, Sears et al. disclose the visualization of genomic sequence data from multiple species in the form of an ideogram and disclose the placement of markers for multiple species on these representations of genomic sequence data, "[t]he ideogram illustrates the genes (or other markers) which have homology in other genome(s). Once a marker is selected, homologous markers on the other genome(s) become visible," (paragraph 46, lines 8-11).

With respect to claim 8 with the additional limitation of a viewer that shows contigs and fragments used to generate the contig, Sears et al. disclose that they provide a method for, "displaying a first type of biological data and a second type of

biological data," (claim 1) wherein, " said first type of biological data comprises . . . contigs of clones . . . CpG islands . . . [and] Simple Tandem Repeats, " (claim 9). Sears et al. thus disclose a method of viewing contigs. Furthermore, since CpG islands and Simple Tandem Repeats represent pieces of the genomic DNA and, since the contigs are generated from those pieces of DNA, these elements of the genome represent fragments used to generate the contig. Therefore, the ability to view these along with the contigs provides for the system disclosed in claim 8 of the instant application.

With respect claim 9 with the additional limitation of a viewer that provides annotation information associated with transcribed regions and to breadth of the claim in the use of the phrase, "annotation information associated with transcribed regions," Sears et al. disclose several items viewable through their display system. Some of such items viewable by the system of Sears et al. include, "gene boundaries, . . . gene predictions from Project Ensembl, . . . Expressed Sequence Tags, Unigene data, . . . Genscan data, predicted exons, [and] known genes, " (claim 9).

With respect to claim 10 with the additional limitation of a synteny viewer, Sears et al. disclose that their display system allows for the viewing of, "orthologous (syntenic) regions between mouse and human, " (claim 9).

With respect to claim 12 with the additional limitation of a viewer that is able to show single nucleotides, Sears et al. disclose that the biological data able to be displayed by their system includes Single Nucleotide Polymorphisms (claim 9). Furthermore, Sears et al. disclose that, "individual gene data, ESTs, and SNPs link to

related sequences," (paragraph 30). Thus by linking from a single nucleotide polymorphism, one can obtain single nucleotides.

Claims 13 and 15-18 are further limiting based upon the number of different viewers the system has (from two or more viewers to all six) from those disclosed in claims 7-12. Since the system disclosed by Sears et al. discloses all six viewers Sears et al. disclose the limitations of claims 13 and 15-18.

With respect to claim 14 with the additional limitation that the display system allow the user to select viewer components, Sears et al. disclose that, "data from a number of different objects are transparently organized and presented to a user. A user can interact with any of the objects presented in the graphical interface and can explore selected objects, " (paragraph 42). Since each of the viewer components are transparent and only activated in response to an action by the user, the user has the capability to select which viewer component they are interacting with at any given time based upon the object they select. Furthermore, the user can enable or disable certain viewer components based upon the level of detail at which they are viewing items in the display.

Claim 19 is drawn to the additional limitation of the inclusion of a database with "substantially complete genomic sequence."

In the absence of an explicit definition for the term, and given that Sears et al. disclose the use of their methodology for, "genome informatics," (paragraph 11) and disclose that their database, "includes genomic data," (claim 22), Sears et al. disclose a database with a substantially complete genomic sequence.

Claim 20 is drawn to the additional limitation that the system is provided in a stand-alone format. In the absence of an explicit definition for the term "stand-alone format" and given that Sears et al. disclose a single computer system which constitutes all of the necessary parts (claim 22), Sears et al. disclose a system in a stand-alone format.

With respect to claim 21, Sears et al. disclose access via the web (paragraph 57, lines 13-17; paragraph 59, lines 8-9).

This anticipation rejection assumes an interpretation for the terms "syntenic blocks" and "syntenic anchors" as homologous regions and markers therefore in line with the teachings of Sears et al.

Applicant's arguments with respect to the prior rejection have been fully considered, but they are not found persuasive.

Applicant argues that Sears et al. cannot anticipate applicants claims:

Sears cannot anticipate independent claim 1 as the reference is missing at least two features of the present claim. In particular, Sears does not disclose comparative genomic data comprising syntenic anchors and syntenic blocks. In fact, Sears is completely silent on what syntenic features and/or methods are used to determine orthologous regions. (remarks, page 3).

In response, the office points to the fact that applicant's claims are drawn to a database comprising comparative genomic data comprising syntenic anchors and syntenic blocks. Hence, Sears et al. need not explicitly disclose methods for the generation of such data only provide evidence of the presence of data in their database that can reasonably be interpreted as syntenic blocks and syntenic anchors. Sears et al. disclose the presence of syntenic (homologous) regions and markers that lie within

those regions (as cited above). Given that Sears et al. define these regions as syntenic regions it is reasonable to interpret the regions themselves as syntenic blocks and the markers that within these regions as "anchors."

Applicant further argues that Sears et al.'s use of the term "synteny" and the Office's interpretations therefrom do not apply to applicant's claims since the applicant has explicitly defined the terms otherwise:

> Synteny refers to linkage of genes in different species where gene order in chromosomes may be conserved over wide evolutionary distances. Paragraph [0056]. Syntenic anchors and blocks are two specific features determined from genomic comparison between at least two species. A syntenic anchor refers to conserved locations in two genomes that are identified by significant DNA sequence similarity and constitute a bi-directionally unique match (i.e., two segments can be designated syntenic anchors if their alignment may be the only significant match either segment may be shown to have to the other genome). A syntenic anchor may have different genomic coordinates in each different species in which it may be identified. Paragraph [0057]. A syntenic block refers to evolutionary conserved regions between two species where the majority of syntenic anchors is consistent with each other and is in mostly consecutive order. A syntenic block may have different genomic coordinates in each different species in which it is identified. Paragraph [0058]. Thus, genomic data including the syntenic anchors and blocks includes chromosomal regions that may include the ordering of several genes. Syntenic anchors and blocks are further illustrated in Figure 1 and paragraphs [0025] and [0067]-[0068]. (remarks, pages 3-4).

While applicant is free to define terms as generally or explicitly as applicant wishes, the supposed explicit definitions cited in the above passages from the specification, do not, in fact, explicitly limit the terms. In fact, applicant's arguments fail to disclose that each definition is an exemplification not a limitation because it is preceded by the term "may" (see, for example, paragraph 56, line 1), "[a]s used herein, the term "synteny" *may* refer to linkage of genes," (emphasis added). Since the terms have not been explicitly defined, it is reasonable to interpret the "synteny" of Sears et al.

as the "synteny" of the instant application since the Office must apply a "broadest reasonable interpretation" to the claim terminology. See, e.g., In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989).

Or, claims 1, 2, 4 and 7-10, 12-21 are obvious over Sears et al. (Patent Publication #2003/0220820) in view of Mural et al. (IDS, Science, Volume 296, Pages 1661-1671, May 2002).

This rejection is newly applied but was necessitated by applicant's amendment (the previous claim set did not contain a claim requiring both that the interactive display system comprise comparative genomic data comprising syntenic anchors and blocks and a multiple sequence alignment viewer. Since the independent claim now contains both of these limitations, all of the claims contain newly claimed subject matter).

The claims are drawn to an interactive display system comprising a database of comparative genomic data and a viewer wherein the comparative genomic data comprise syntenic anchors and syntenic blocks and the viewer comprises a multiple sequence alignment viewer.

Sears et al. disclose an interactive display system comprising a database of comparative genomic data and a multiple sequence alignment viewer (as cited above). However, Sears et al. do not disclose comparative genomic data comprising syntenic anchors and syntenic blocks as exemplified in applicant's specification.

Mural et al. disclose comparative genomic data comprising syntenic anchors and syntenic blocks as exemplified by applicant's specification (for example, page 1663, 2nd column, 2nd paragraph and 4th paragraph).

It would have been obvious for one of ordinary skill in the art, at the time the invention was made, to include the comparative genomic data of Mural et al. in the system of Sears et al. One of ordinary skill in the art would have been motivated to do so because the inclusion of such information would help one better define regions of evolutionary (and likely functional) conservation between sets of species in the database (for example, Mural et al., page 1663, 1st column, 3rd paragraph, lines 7-10).

With respect to claims 2, 4 and 7-10, and 12-21 Sears et al. disclose the claim limitations (as cited above).

8. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sears et al. (Patent Publication #2003/0220820) or Sears et al. (Patent Publication #2003/0220820) and Mural et al. (IDS, Science, Volume 296, Pages 1661-1671, May 2002) as applied to claims 1, 2, 4, 7-10, and 12-21 above, and further in view of Kent et al. (Genome Research, vol. 12, pages 996-1006, June, 2002) and the Browser archive history provided with the previous Office Action. This rejection is newly applied but necessitated by applicant's amendment.

The claims are drawn to the system of claim 4, with the additional limitation that the system contain genomic data from three or more species (claim 5) where the third species is rat (claim 6).

Applied above, claim 4 is either disclosed by Sears et al. (as cited above) or obvious over Sears et al. and Mural et al. (as cited above). However, Sears et al. or the

combination of Sears et al. and Mural et al. do not disclose a system with three species (claim 5) including rat (claim 6).

Kent et al. disclose a system that had three species including rat in November of 2002 (see browser archive history presented previously).

It would have been obvious to one of ordinary skill in the art at the time the invention was made, to include the rat sequence found in the system of Kent et al. in the system of Sears et al. or the combined system of Sears et al. and Mural et al. One of ordinary skill in the art would have been motivated to do so because through the inclusion of additional genomic sequence, one could better meet the goal of genetic science to determine the genetic proximity of organisms (Sears et al., paragraph 7, lines 4-5) and the rat sequence could be used to assist in gene annotation in the human and mouse genomes (Mural et al. , page 1663, 1st column, 2nd paragraph, lines 1-5 and referenced point 16, therein).

Conclusion

9. No Claim is allowed.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ritesh Agrawal whose telephone number is (571) 272-2906. The examiner can normally be reached on 8:30 AM - 5:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on 571-272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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